

Exhibit 5
to Declaration of Rachel Doughty

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10 **BEFORE THE STATE WATER RESOURCE CONTROL BOARD, OFFICE OF**
11 **ADMINISTRATIVE HEARINGS**

12 **STATE OF CALIFORNIA**

13 In the Matter of:

14 VV: INV 8217

15 DRAFT CEASE AND DESIST ORDER
16 ISSUES AGAINST BLUETRITON
17 BRANDS, INC.

18 **SUR-SUR REBUTTAL**
19 **TESTIMONY OF GREGORY**
20 **ALLORD (SOS 288)**

1 I, Gregory Allord, declare as follows:

2 The facts set forth in this declaration are based on my personal knowledge, and if called as a
3 witness, I could and would competently testify thereto under oath.

4 1. My career as a Cartographer began using traditional photomechanical techniques,
5 transitioned through the early implementation of computer-assisted mapping and fully realized GIS
6 and digital publishing and cartographic processes were the norm when I retired. I participated in
7 numerous projects as a cartographer, cartographic specialist, project and program manager during
8 all three phases. These included multi-volume nationwide scientific reports, proof-of-concept of
9 GIS and the scanning and georeferencing the entire collection of historical USGS topographic
10 maps. As a result, I have personal or professional knowledge or experience with the multiple
11 generations of the maps and methods referenced in BTB 38. SOS 289 is a true and correct copy of
12 my CV and publication list.

13 2. I offer in this declaration a rebuttal of the Written Surrebuttal Testimony of Mark Nicolls
14 (BTB 38), the map comparison images in BTB 39, and Mr. Nicholls' oral testimony on 4/25/22.

15 3. Mr. Nicholls testified that the depiction of water features in the upper Strawberry Canyon
16 on a 1905 USGS subject matter map (SOS 091, "Plate 12") are "imprecise," and that it can be
17 inferred that features on this map, other than irrigation features, were drawn without "attention to
18 detail" and are therefore unlikely to be reliable. (BTB-38, pp 1-2, including footnotes).

19 4. Plate 12 was created using two existing USGS 15', 1:62,500 topographic quadrangles—
20 Redlands and San Bernardino (1901)--as base maps (the "Base Maps") and the report was
21 compiled and written by a third scientific team, led by W.C. Mendenhall and J.B. Lippincott, who
22 used the two topographic maps for field work. **In my opinion this was standard operating
23 procedure of using topographic quadrangles as base maps was implemented in the very early
24 years of the USGS.** It is further described in SOS 301, which is a true and correct copy of an
25 article describing the historical production of USGS topographic maps, which I downloaded in
26 May 2022 from the American Library Association's website, as well as contemporaneously in
27 SOS 297_005 (authenticated below). SOS 290 and SOS 291 are true and correct copies of the Base
28 Maps, downloaded from USGS's TopoView in April 2022.

1 5. **SOS 292** is a true and correct copy of USGS fact sheet: *History of U.S. Geological Survey*
2 *Scientific Peer Review and Approval, 1879-2019*, downloaded from the USGS in May 2022. **In**
3 **my opinion it accurately describes the rigorous scientific review that the USGS has employed**
4 **in its publications since 1879.** John Wesley Powell in 1884 and 1885, as the second Director of
5 the USGS, testified to Congress on the necessity of topographic maps as the basis of geologic
6 maps because of their reliable representation of natural features, such as streams and bodies of
7 water, valleys, hills, and mountains. **In short, it is my opinion that the purpose of USGS**
8 **topographic maps, including the Base Maps was to accurately represent these natural**
9 **features, including water.** A true and correct copy of USGS publication *Minerals, Lands, and*
10 *Geology for the Common Defence and General Welfare*, V.2 (1879-1904) by M. C. Rabbitt,
11 downloaded from the USGS in May 2022, describing USGS mapping in the late 1800s is attached
12 as **SOS 293**.

13 6. The Base Maps were created using the explicit mapping standards of the USGS techniques
14 and methods, which are described in *A Manual of Topographic Methods* (1893) by H. Gannett,
15 USGS Monograph 22, which was intended as direction for experienced surveyors working on
16 USGS topographic maps, and includes highly technical direction on astronomic measures,
17 triangulation and surveying, traverses and field methods, geologic and hydrographic features; and
18 cartography (then referred to as sketching). **SOS 294** is a true and correct copy of Monograph 22,
19 downloaded from the USGS website in May 2022.

20 7. Monograph 22 directs correct field practice, clearly showing field crews were on site and
21 mapped physical features based upon direct observation. (**SOS 294**.) “The traversing should
22 follow, in order that all the control may be furnished to the chief of party for his use in sketching
23 [cartography]. This order, which is followed as closely as practicable, requires that the members of
24 the party be scattered over a considerable area of country, and if they are living in camp it requires
25 that they remain away from it a considerable part of the time, or else that a large amount of
26 traveling be done in order to reach camp at night. Where they are not living in camp the most
27 economical disposition is to scatter them at various places within their fields of work.” (**Id. at 132**);
28 “Sketching goes on coincidently with the measurement of heights” (**Id. at 145**); “the chief of party

1 should go over the ground, sketching the drainage, culture, and forms of relief” (*Id.* at 146); and
2 “From a great altitude the lower details will be dwarfed and will measurably disappear, while from
3 low points the relations, forms, and masses of the greater elevations cannot be properly seen. In
4 such a country stations at different elevations must be selected in order to see all parts of the
5 country to the best advantage. The extreme summits will prove of little service as sketching
6 stations” (*Id.* at 145).

7 8. Plate 12 is properly termed as a thematic map portraying interpretative scientific field
8 observations. The signed Letter of Transmittal published in WSP 142 serves as a modern
9 equivalent of the purpose and scope of the field investigation, scientific interpretation and
10 published results. (SOS 001_4) Mendenhall was focused not just on irrigation infrastructure in his
11 study, but also on percolating waters. (*Id.*) **In my opinion, the USGS peer review process would
12 have applied to Mendenhall’s study (SOS 001)—its approval, conduct, write up, and review.**

13 9. Mr. Nicholls testified that Plate 12 “does not include a symbol on the legend to identify
14 specifically what type of hydrologic feature the dashed blue line is intended to reflect . . .”. (BTB-
15 38_7:19-22.) The is readily explained by knowing the Legend for Plate 12, WSP 142 explains the
16 symbols used specifically for the features that are part of the thematic map from Dr, Mendenhall’s
17 study and not for any features from the Base Maps. This is consistent with USGS’s long-standing
18 practice to publish topographic mapping symbols in separate brochures rather than engraving
19 established symbols on each topographic quadrangle. SOS 296 is a true and correct copy USGS
20 Circular 1341, *History of the Topographic Branch (Division)* (2009) downloaded from the USGS
21 website. **It is my opinion, based upon my viewing of tens of thousands of historical USGS
22 maps, that the symbols for perennial and intermittent streams have stayed the same for the
23 approximately 140 years, since the first USGS topographic maps were released, and the
24 upper reaches of Strawberry Creek are therefore accurately portrayed on the 1901 Redlands
25 quadrangle as they were observed in 1898/99 (SOS 291), which were relatively dry years
(SOS 001_019).**

26 10. I asked Ms. Doughty’s office to inquire at the U.S. Board on Geographic Names
27 (“USBGN”) regarding Strawberry Creek. SOS 298 is a true and correct copy of correspondence
28

1 she sent to me, which I believe to be genuine. Ms. Runyon, of the USBGN wrote that Strawberry
2 Creek “was first labelled on U. S. Geological Survey topographic maps in 1899 so we presume it
3 was found in local use when the surveys for that map were conducted. Unfortunately, the field
4 notes for those early maps were discarded many years ago, although it was never required that the
5 surveyors record the history of the names they collected; they were instructed to simply verify the
6 name, spelling, and location” SOS 298. The USBGN has since 1890 been the official, authoritative
7 listing of places names for the United States. **This written communication, which in my opinion**
8 **is credible and consistent with USBGN practice, serves as a second source affirming the**
9 **existence and location of Strawberry Creek.**

10 11. **Based upon my understanding of historical mapping technique and reliability, it is my**
11 **opinion that the methods used to create USGS topographic maps in the late 19th Century,**
12 **including the Base Maps were sophisticated and accurate, and that Dr. Mendenhall would**
13 **not have used “imprecise” base maps lacking “attention to detail” as Mr. Nicholls testified.**

14 12. Mr. Nicholls alleges Plate 12 (including the Base Maps) was “created prior to the
15 development of photogrammetric mapping practices used to create subsequent topographic maps
16 which more precisely depict topographic features.” (BTB-38_2, n.3) While photogrammetry did
17 improve the efficiency of topographic mapping, this does not minimize or negate the quality of
18 previous topographic maps, as Mr. Nicholls suggests, nor are there any fundamental “differences
19 in mapping objectives” between modern and 1880s USGS topographic maps. The practices have
20 changed but the adherence to current standards of map accuracy also remain true for all eras of
21 USGS topographic maps. Photogrammetric mapping practices have constraints that are different
22 from earlier eras. For example, the distance from the feature mapped is greater, mapping can only
23 be done accurately during leaf-off seasons so riparian vegetation is not as apparent to the observer,
24 and shadows can present challenges in mountainous terrain, like Strawberry Canyon.

25 13. Georeferencing relies on a model relating known image coordinates on the paper map to
26 known latitude/longitude coordinates. The goal is simply to maintain whatever accuracy exists in
27 the original map and make it usable in a GIS. Scanned maps are georeferenced to the original map
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1 datum.¹ Georeferencing, selecting the exact center of known control points, is important.
2 Longitude/latitude intersections are the points on all maps that fit this criterion, since they are
3 static and evenly distributed across the map so that mathematical model remains with evenly
4 distributed control points. SOS 299 is a true and correct copy of a paper I, with others, authored
5 describing in greater detail the process of accurately georeferencing historical maps.

6 14. Mr. Nicholls' describes "methodology for the comparison of hydrologic features" across
7 several different generations of maps. (BTB-38_3). His approach is unclear and possibly
8 problematic. Specifically: (1) it is presumed the PDF Mr. Nicholls' started with is a raster image
9 but the resolution is not stated; (2) the PDF was imported into a GIS so it may be presumed it is
10 technically a GeoPDF, but that is not known; (3) Mr. Nicholls does not indicate which features
11 were used as common reference points across maps. For example, Plate 12 has 28 well defined
12 latitude and longitude points. If these were used, a high degree of transformation would be
13 possible. But instead, Mr. Nicholls appears to have relied upon commonly identified geographic
14 features (river intersections or other landmarks), despite the availability of longitude and latitude
15 intersection points, and so a low precision of transformation is a major concern. The result is that
16 in BTB-38_7:7-9, Mr. Nicholls declares the misplacement of stream location versus topography of
17 150 feet (which I presumed to mean vertically). It is also possible that Mr. Nicholls failed to account
18 or compensate for different datums between the different eras of maps. Further, because Mr.
19 Nicholls resized the map, any georeferencing error would be magnified. **It is my opinion that Mr.
Nicholls' conclusions based upon his georeferencing exercise, as described, are unreliable.**

20 15. In BTB-28_8:20 Nicholls testifies that "the degree of imprecision in the topography
21 depicted on the 1905 hydrologic map renders it impossible to reliably determine the proximity . .
22 .". However, when I reviewed the 1901 topographic quadrangles, Strawberry Creek is correctly
23 located and lines up correctly with the topographic contours. SOS 091, SOS 290, SOS 291. **It is
24 my opinion that the misalignment on Plate 12 is a result of misaligned printing plates.** The

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26 ¹ Datum is defined in, SOS 300_270, which is a true and correct copy of USGS publication *Maps for*
27 *America*, which was downloaded from the USGS website: In surveying, a reference system for computing
or correlating the results of surveys. There are two principal types of datums: vertical and horizontal.

1 historical printing process is described in **SOS 297_007**, which is a true and correct copy of
2 Methods of Geologic Cartography in use by the United States Geological Survey, by J.W. Powell
3 and W.J. McGee, presented at the International Geologic Conference in Berlin in 1885, which was
4 printed in 1888 and downloaded from the USGS Website in May 2022.

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6 I swear under penalty of perjury that the foregoing is true and correct to the best of my
7 knowledge.

8 Executed on this 16th day of May 2022, at Madison, Wisconsin.

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10 By: 
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